WE CLAIM

1) Method for controlling and optimising the cycle for production of ice cream depending on the mixtures used in the ice-cream making machines, comprising a freezing cylinder exchanging heat with the evaporator of a refrigerating circuit, and a stirrer/scraper element rotating inside said freezing cylinder and actuated by a suitable electric motor, further comprising a processing element, sensors for detecting continuously the temperature values of the refrigerating gas at the inlet and at the outlet of said evaporator and means for detecting continuously the value of the electric power used by said electric motor, said temperature values and said values for the electric power used by the said electric motor being continuously input into said processing element; a software program in said processing element for processing said values being able to provide an output signal which drives an impulse solenoid valve which introduces continuously the hot gases taken from the exhaust of the said compressor into the main stream of refrigerating fluid.

2) Method according to Claim 1, in which the said introduction of hot gases into the main stream of the refrigerating fluid is regulated by said processing element so as to maximise and keep constant, over time, the transfer of heat from the product contained in the freezing cylinder to the refrigerating fluid in the evaporator without resorting to differences in temperature between the product and the refrigerating fluid which are too low, by means of an increase in the thermal supply factors of the fluids in contact with the wall of the freezing cylinder.

3) Method according to claim 1, further comprising a thermostatic valve, in which the injection of hot gas into the refrigerating fluid downstream of

said thermostatic valve produces an increase in the speed of the refrigerant with a consequent increase in the removal of heat and therefore with an increase in the overall transfer coefficient of the exchange between product and refrigerating fluid.

4) Machine for implementing the method according to Claim 1, comprising a freezing cylinder exchanging heat with the evaporator of a refrigerating circuit, and a stirrer/scraper element rotating inside said freezing cylinder and actuated by a suitable electric motor, and further comprising a data processing control unit, sensors for detecting continuously the temperature values of the refrigerating gas at the inlet and at the outlet of the said evaporator, which are connected to said control unit; means for detecting continuously the value of the electric power used by the motor, which are connected to said control unit; and means in said control unit for processing said values and able to provide a signal which drives an impulse solenoid valve which introduces continuously the hot gases taken from the exhaust of the compressor into the main stream of refrigerating fluid.